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THE STABILIZATION OF JOINTS IN CHILDHOOD*

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Because of the uncertainty in the minds of many physicians concerning the method and time at which the unstable, painful, or diseased joint of the child should be stabilized, the essayist has been stimulated to present a few general remarks on the stabilization of joints in childhood. Certain conditions are more common among children than among adults and these will form the basis for this discussion. These thoughts represent the generally accepted opinions of the orthopaedic surgeons of today and are not presented as original ideas on the part of the author.

It has long been recognized by the orthopaedic specialist that the painful joint which is affected with disease and injury, and the relaxed joint which has little stability, is often better immovable than movable. This is sometimes difficult for those physicians to appreciate who seldom see these types of cases. A stiff joint may sometimes be inconvenient, unsightly and annoying, but the extremity will be functionally good and painless. To permit the knee of a young child to become stiff for life seems in itself a tragic occurrence and is truly unfortunate, but what is the alternative? If the joint is affected, for example, with an early tuberculosis and motion is temporarily saved, it may be only for a very short time; with a recurrence of the symptoms the tuberculous process may become active in a more severe form. The tuberculosis may have spread to other parts of the body and then it becomes a question of not only whether the extremity can be saved but even the child's life. How much better

it would have been to have stabilized the joint in the beginning; given the tuberculosis its best chance to heal; saved months of pain and suffering and averted the likelihood of such a serious later condition.

Conditions in children's joints which necessitate stabilization are caused most often by tuberculosis and infantile paralysis. The former acts by directly destroying and undermining the intra-articular joint structures, the latter by paralyzing and weakening the supporting muscles and ligaments of the joint. Some of the other less common causes are pyogenic arthritis, atrophic arthritis, cerebral spastic paralysis, spina bifida, peripheral nerve and spinal cord injuries, progressive muscular atrophy, scoliosis, congenital dislocation of the hip and old fractures. The joints of the lower extremities much more frequently require stabilization than those of the upper because of the necessity of weight bearing.

Tuberculosis: In tuberculosis the spine, hip and knee—in this order—are the most frequently affected joints. The occurrence is so infrequent in the other joints that they form a distinctly minor problem. Sometimes there will occur spontaneous bony ankylosis of the joint with healing of the tuberculosis following non-operative care such as rest on frames or in traction, plaster, and braces. This is particularly true in the young child. Absorption of the tuberculous pus and necrotic tissue will gradually take place and the diseased area will be replaced with dense fibrous tissue and new bone. In the older child it is often desirable to aid this healing process with an operative fixation of the joint or joints. In the case of the spine and hip this should always be an extra-articular procedure. Years of active treatment are sometimes saved and the end results are often more

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permanent. The author does not believe, however, that an operation to secure an ankylosis is always advisable in the child under six to eight years of age. Each case is an individual problem and there is no hard and fast rule.

In the spine either the Albee bone graft, the Hibbs fusion, or one of the modifications of these operations, are most frequently used. In the Albee operation the transplant is usually taken from the tibia and placed in the split spinous processes. In the Hibbs operation a bridge of small bone chips is created over the posterior portion of the spine by chipping up the laminae and spinous processes. When these operations are successful a bridge of solid bone is formed which splints the diseased area and thus eliminates motion in the affected joints and allows the tuberculosis to heal more rapidly.

In the hip the most popular operative procedure, until 1926, was a resection of the joint and tuberculous tissue or as much of the latter as could be removed. This was not always followed by an ankylosis. When it was shown that a solid bony fixation often followed an extra-articular operation without joint resection, the number of hip resections decreased and the extra-articular procedure became the operation of choice. In this latter procedure bone is placed from the upper end of the femur and greater trochanter across to the ileum. This bone may be obtained from the upper shaft of the femur, the crest or wing of the ileum, or from the tibia. When the operation is successful a strong substantial bridge of bone is created which fixes the joint, increases in size and strength with weight bearing, and allows a complete healing of the tuberculous process.

The knee joint is best stabilized by a resection of the joint surfaces and the underlying tuberculous tissue. Sometimes tibial grafts driven across the joint will aid fixation after the resection and promote earlier bony ankylosis. Without resection these grafts occasionally will produce a stiff joint. The extra-articular operations for the knee have not been generally successful although an occasional satisfactory result has been reported.

Infantile Paralysis: In infantile paralysis joints which have lost their stability as a result of the paralysis of muscles form the largest and most important group which require stabilization. For a joint to function properly there must be normal power in the muscles controlling its motion. If one muscle or muscle group becomes weak or paralyzed there is an immediate imbalance. The strong, unaffected, antagonistic muscles may contract and stretch the paralyzed muscles, thus further weakening them and decreasing their chances for maximum recovery. If the paralysis is in the lower extremity and weight bearing is allowed, the ankle and foot may turn in or out, the knee may bend backward or contract, and the hip may draw up or even dislocate. In each instance irregular, abnormal joint surfaces result which become more marked with time and continued use. It is imperative that something be done to prevent both this condition and the development of a permanent deformity, as well as to stabilize the joints so that weight bearing can be allowed safely. External supports in the form of braces and splints always play a part in the early stages but later the question arises of how the brace can be discarded. Operative procedures are then considered. Sometimes joint stability can be obtained by tendon and muscle transplantation, but, if this is not possible, a bony fixation of the joint in the position for maximum usefulness is definitely indicated.

The joints of the foot are those most frequently stabilized and it is the Hoke arthrodesis or one of its modifications which is most often employed. In a foot which is constantly assuming a varus or valgus position on weight bearing, or has a permanent deformity of this character, the stabilization of the joints between the astragalus and the os calcis and scaphoid, and between the os calcis and cuboid is definitely indicated. For foot drop and calcaneal deformity this also may be the best procedure. However, the first of these may be supplemented by the creation of a mound of bone on the posterior superior surface of the os calcis which, by striking against the tibia, prevents flexion of the ankle and foot drop (the Campbell bone-block opera-

tion). Very often the astragalectomy of Whitman is the operation of choice for the paralytic calcaneus or calcaneo-valgus. Following all of these operations great care should be taken to displace the foot well backward and to remember that slight valgus is always better and less painful than slight varus. The ease and comfort with which some of these infantile paralysis patients with unstable feet can walk after the operation is astounding and proves the worth of the operative procedures. Foot stabilization is probably the most satisfactory surgical phase of the orthopaedic specialty.

The unstable knee of the patient with infantile paralysis may often be improved with a tendon or muscle transplant. The quadriceps muscle is the one most often paralyzed. A transplant of one of the hamstrings into the patella may lead to a stable knee which will not "jack-knife" on weight bearing. A knee joint can be supported with bracing better than the foot and ankle. The advisability of stiffening the unstable knee joint of an active boy should always be considered seriously. Some surgeons advocate knee joint arthrodesis more often than others. Each case is an individual problem and should be treated accordingly. The operative procedure is different from that described for a tuberculosis of the knee only in that it is necessary to remove the cartilaginous surfaces to secure an ankylosis.

In the hip an arthrodesis of the joint seldom is to be considered. If there is a contraction deformity—which is often present—this should be corrected first and then a decision reached regarding the best procedure to increase the joint stability. Muscle transplants here are often followed by marked improvement in stability. For the paralysis of the gluteus maximus the following two procedures are to be considered: (1) The erector spinae muscles are freed from their lower attachment and a long strip of fascia lata is removed and sutured to them, passed over the paralyzed gluteus maximus muscle, and fixed into the femur at the insertion of the gluteus maximus (Ober operation) or (2) the origin of the tensor fascia lata muscle with its bony attachment is transplanted into either the pos-

terior superior spine or the adjacent posterior portion of the iliac crest (Dickson operation). For a paralysis of the gluteus medius a procedure similar to the latter may be done except that the origin of the tensor fascia lata is transplanted onto the crest of the ilium directly above the greater trochanter (Legg operation). If there is a markedly relaxed hip joint or a pathological dislocation a shelf operation may increase the stability of the joint.

The stabilizing of joints in the upper extremity does not present the problem it does in the lower extremity. The shoulder joint is that most frequently arthrodesed. If there is enough muscle power left in the markedly paralyzed and relaxed shoulder girdle to move the scapula and shrug the shoulder and there is a useful function in the hand, an arthrodesis of this joint is indicated and justified. With the head of the humerus firmly fixed to the scapula this remaining muscle power will move the shoulder and materially improve the usefulness of the extremity. The most common operative procedure to secure an ankylosis is to completely denude the joint surfaces of cartilage, split off the lower portion of the tip of the acromion process leaving it attached at its medial end, and insert the lateral end into a prepared slot in the upper end of the humerus. This operation is frequently done through a window in a plaster shoulder spica which has been applied with the shoulder in the best position for function. This, in a child, is usually 75 degrees of abduction and 45 degrees flexion (forward to the normal position at the side of the body). In the elbow the stability and usefulness of the joint can be improved with incomplete paralysis of the flexors by the transference of the common flexor tendon with its bony attachment to the internal condyle two inches higher on the shaft of the humerus (Steindler operation). If there is a paralysis of the extensors of the wrist, an arthrodesis of this joint in 25 degrees of dorsiflexion will produce a more useful hand. With a paralysis of the opponens pollicis and instability of the thumb, a transference of the extensor pollicis brevis into the tendon of the palmaris longus often will enable the thumb to be apposed to

the fingers and thus increase the usefulness of the hand.

Other Conditions: All of the other conditions affecting joints in children which may require an arthrodesis or other stabilizing operation are distinctly of minor importance compared to tuberculosis and infantile paralysis. Only the more important conditions and procedures performed in these will be discussed.

In the young child the badly infected pyogenic joint may ankylose itself in spite of all treatment planned to preserve motion. Occasionally this will not take place and, after the acute process has terminated, motion will remain. From the x-ray appearance of some of these joints it is difficult to understand how painless motion could be possible. In later life pain may arise but not until then should arthrodesis be considered. Sometimes a fixation cast is advisable to allow the joint to stiffen in the position for maximum usefulness. Seldom is an open operation indicated but, if so, it should consist of no more than an erosion of the cartilaginous surfaces.

In an atrophic arthritis with an erosion of the joint surfaces it may be advisable to allow the joint to ankylose. Sometimes a simple immobilization of the joint in a cast or splint will suffice to secure an arthrodesis. The hip is the joint which most often requires operation. If it is necessary to perform an arthrodesis, a removal of the joint surfaces is usually sufficient to secure ankylosis.

In cerebral spastic paralysis joint stability always follows an improvement in muscle function so that treatment should be directed along this line first. Braces seldom are satisfactory to secure joint stability. The foot which may constantly turn in or out is most often the part requiring an operation. In this instance the foot stabilization as described for infantile paralysis is usually the best operative procedure.

In peripheral nerve and spinal cord injuries there may be a complete or partial paralysis of one or more muscles. In peripheral nerve injuries more often it is the sciatic or external peroneal nerve which is affected in the lower extremity and the musculospiral in the upper. For the flail foot

the Hoke arthrodesis supplemented with a Campbell bone-block is often indicated and for the wrist drop an arthrodesis in 25 degrees of dorsiflexion is advisable. In the severer spinal cord injuries with complete or partial paralysis of the lower extremities surgery and braces are indicated as in infantile paralysis.

The unstable and contracted joints of the lower extremities in spina bifida form problems similar to those of infantile paralysis. However, both feet require fixation more often than in infantile paralysis. Rotations and angulations of the tibia and femur may need correction by osteotomy to give increased stability in weight bearing.

In the peroneal type of progressive muscular atrophy, in which there is a gradually developing varus in one or both feet, a subastragalar arthrodesis will often prevent the increase of deformity and help walking. The operation, however, in no way retards the progress of the disease and often after the operation the patient has not sufficient muscle power to walk.

The instability of the old unreduced, congenital dislocation of the hip sometimes presents a difficult problem. Seldom is a resection of the joint or arthrodesis advised. The operative procedures are all designed to increase stability and maintain motion. The most satisfactory is the Gill operation, or one of its modifications, in which a bony shelf is laid down over the head of the femur. The bone in the Gill procedure is obtained from the wing of the ilium. There are other types of shelf operations in which bone transplants are taken from the crest of the ilium or the tibia. Unless the shelf is sufficiently large and stable the operation is seldom successful. The subtrochanteric osteotomy of Schanz is quite popular in some clinics. With the extremity in abduction weight is borne on the large upper portion of the femur which lies against the pelvis and this results in improved stability. The bifurcation operation of Lorenz, in which—after an oblique osteotomy below the lesser trochanter—the upper end of the femur is placed in the acetabulum and the upper fragment is allowed to unite with the

lower fragment, is usually followed by a more stable joint.

In recent years there has been a great deal of discussion about spinal fusion operations in scoliosis. The trend of thought is now distinctly away from the widespread use of this operation because it has been conclusively demonstrated that stabilization of the spine for lateral curvature does not always prevent the increase of the deformity. Fusion is reserved for those cases which show marked deformity due to infantile paralysis and for those which become progressively worse with conservative treatment. Scoliosis is still one of the unsolved problems of orthopaedic surgery. We are acquiring a more thorough understanding of the pathology and the time may come when we will know how to prevent its onset or progress once it has developed.

Following fractures and epiphyseal displacements involving joints there may result irregular joint surfaces which become extremely painful with constant motion. New bone and cartilage is often produced to add to the incongruity of the joint. In this instance even though the condition exists in a child an arthrodesing operation is to be carefully considered. Growth deformity may follow displacement of the epiphysis and produce a relaxed joint as well as a painful one. Osteotomies to correct an angulation or rotation may be indicated as well as an arthrodesis.

It is hoped that the above discussion has thrown some light on this perplexing problem of when to stabilize a child's joint and how this should be done. It is a procedure always to be considered for the painful, diseased, and unstable joint in a child of any age. Often the sooner this joint is freed of pain and made stable, the better it is for both the surgeon and the child.

Conclusions:

1. In a child, tuberculosis and infantile paralysis most often cause the painful and relaxed joint requiring stabilization.

2. Arthritis, cerebral spastic paralysis, congenital dislocation of the hip and old fractures form a distinctly secondary group of causes.

3. The more common operative procedures to secure joint stabilization are briefly dis-

cussed and described, with the indications for the same.

Delaware Trust Building.

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VOCATIONAL REHABILITATION

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The Delaware State Board for Vocational Education announces the opening of an office in the Delaware Trust Building, Room M-218, Wilmington, Delaware, for the purpose of receiving applications for service to physically handicapped persons eligible for the same.

The Delaware Vocational Rehabilitation Act, effective July 1, 1939, accepts the provisions of the Federal Vocational Rehabilitation Act, which was approved June 2, 1920, and provides "for the promotion of vocation-

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al rehabilitation of persons disabled in industry or otherwise and their placement in employment." The term "rehabilitation" is defined in the Act to mean "the rendering of a person disabled fit to engage in a remunerative occupation." The term "persons disabled" is defined as "any person who, by reason of a physical defect or infirmity, whether congenital or acquired by accident, injury, or disease, is, or may be expected to be, totally or partially incapacitated for remunerative occupation." On the basis of these and other statements contained in the Act, those charged with the responsibility for administration hold that the fundamental objective of the Act is twofold:

- (1) Vocational reestablishment of persons with employment experience who become vocationally handicapped as a result of parmanent physical disability; and
- (2) The establishment in remunerative occupations of persons without employment experience who are permanently physically handicapped, and whose normal opportunity for employment is materially affected by reason of such physical disability.

This twofold objective of the Act does not include programs or services which do not contemplate restoration of the disabled person to complete employability. Consequently, educational, welfare, social, and medical or surgical services do not of themselves constitute vocational rehabilitation. However, any one or any combination of these services may be a prerequisite to the vocational rehabilitation of an individual. Again, service to a disabled person which fits him only for casual employment or for employment which when continuously pursued does not render him self-supporting, does not constitute vocational rehabilitation.

The purpose of vocational rehabilitation, as clearly expressed in the Federal Vocational Rehabilitation Act, is the return to, or establishment in, employment of the physically disabled. The Act does not specify the various methods by which this objective is to be effected. However, we interpret the process of vocational rehabilitation to be that of adjust-

ing the disabled person to remunerative employment through elimination or amelioration of those factors which render or may render the individual unemployable. The factors which usually render persons unemployable are:

- (1) Loss, impairment or lack of skill
- (2) Loss or impairment of function of a member or organ of the body
- (3) Loss of morale

The inability of many disabled persons to secure employment may be due to the factors for which they themselves are not responsible. Some employers, when considering disabled persons for employment, consider the "disability" of the applicant rather than the "ability" of such person. The function of the rehabilitation service in any case is to ascertain the factors which handicap a disabled person in securing employment, and through appropriate procedures either to eliminate or ameliorate those factors.

The State Board for Vocational Education deems it advisable to follow as nearly as possible the policies as promulgated by the Federal Board for Vocational Rehabilitation and adhered to uniformly throughout the nation, a summary of which is here set forth.

ELIGIBILITY AND FEASIBILITY FOR SERVICE

A "physical defect or infirmity" is interpreted to mean a *permanent* skeletal or organic impairment. It should be emphasized, also, that a physical disability does not necessarily constitute eligibility for rehabilitation service. The nature and extent of the disability must be such as to handicap the individual in the pursuit of his vocation, or the disability must be of a progressive type which will later constitute a vocational handicap. These criteria apply to disabled persons with vocational experience. In the case of a person who has never worked, the disability must be a major one which lessens his normal opportunity for employment.

The term "remunerative occupation" has reference to any legitimate occupation at which normal persons ordinarily earn a livelihood.

Although age limitations for rehabilitation are not prescribed by the Act, we believe that

we should observe the state laws with respect to the age of employability, in the placement of young handicapped persons; and that children too immature to profit by vocational training or other rehabilitation service and adults beyond working age should not be accepted for rehabilitation service.

In formulating our policies covering eligibility of persons for rehabilitation service, we have interpreted the Act as providing for the establishment or reestablishment in remunerative employment of disabled persons who are unable to earn a livelihood because of a physical handicap. Such vocational handicap may have been acquired by accident, injury, disease, or from congenital causes.

It is not the purpose of the Act to give assistance to persons with minor physical disabilities which do not lessen normal opportunity for employment, nor to those with major disabilities who are already self-supporting.

Eligibility for vocational rehabilitation service does not necessarily imply feasibility for the service. We recognize that such factors as advanced age, degree of physical disability, attitude of mind, or social status, sometimes make it inadvisable, uneconomic, or impossible to render a vocational rehabilitation service to an individual.

In general, a disabled person is considered feasible of rehabilitation when:

1. The nature and degree of his disability will permit of his preparation for and placement in a specific job or occupation on full-time basis.
2. He is mentally competent to manage his own affairs without the necessity of constant supervision.
3. His personality is such that he is able to get along with others and his attitude gives promise of cooperation in his rehabilitation and subsequent employment.
4. Facilities for rendering the services required in rehabilitating him are available and reasonable of acquisition.
5. Dependable arrangements can be made for taking care of his living costs and those of his dependents during the period of rehabilitation.

ELIGIBILITY AND FEASIBILITY OF SPECIAL GROUPS

In determining the eligibility and feasibility of persons having cardiac, tubercular, visual, hearing, diabetic, and other hidden disabilities, we should consider each case in the light of the classification into which it falls. The examining physician is requested to classify each case according to the guide contained in the physician's statement, supplied by our division. The suggestions and precautions concerning occupational activity and working conditions suggested under the several classifications, should be carefully considered in selecting employment objectives for the various types and degrees of these handicaps. The classifications and suggestions concerning employment for cardiac and tubercular groups are those used by the American Heart Association and the National Tuberculosis Association respectively. The classification of other groups were arrived at through conferences of medical and vocational specialists engaged in work for the respective group.

CARDIAC (ORGANIC)

Class I. Able to Carry on Habitual Physical Activity

Cases in this classification offer no special problem and will not be considered as eligible for service unless, in the opinion of the medical examiner, the patient should change his occupation because of the danger of aggravating his physical condition. Such other limitations, as described by the medical profession will also be recognized.

Class II A. Able to Carry on with Slightly Diminished Physical Activity

Cases in this classification are eligible and feasible for selected types of employment. The employment objective selected must in every case be approved by a physician before the client is placed in training or employment, and the client must agree to report periodically to a clinic or the examining physician for a check-up of the results of the work on his physical condition.

Class II B. Able to Carry on with Greatly Diminished Physical Activity

In accepting these cases as feasible of ser-

vice, we depend strictly upon the recommendations of the examining physician. Sedentary occupations are usually required for this type of case. An agreement for close observation is also required.

Class III. Unequal to Any Physical Activity

Cases in this classification are not considered as feasible; however, if the prognosis is good, action on the case may be postponed, pending satisfactory reclassification.

CARDIAC (FUNCTIONAL)

Class IV. Possible Heart Disease

Class V. Potential Heart Disease

Inasmuch as the five classifications described above are, for purposes of rating, cases of heart disability as to work capacity, all cases in Classes IV and V should be given ratings on the same scale as that applied to Classes I, II A, II B and III—i. e., it should be indicated whether they are "able to carry on habitual physical activity;" "able to carry on with slightly diminished physical activity;" etc.

TUBERCULOSIS

An applicant who has tuberculosis will be considered *eligible* for service when:

1. (a) If formerly employed, he is unable to return to his best job prior to contracting the disease, or
(b) If never employed, he is considered on the basis of the physician's prognosis to be vocationally handicapped.
2. He meets the requirements as to age and residence as required under the general policies of eligibility.

A tubercular person will be considered *feasible* of rehabilitation when:

1. The disease has remained arrested for a period of at least six months, the sputum is negative, and when on re-examination the physicians' prognosis is "good."
2. The physician is willing to approve the patient for the employment objective selected and, at least, a seven-hour work day.

3. The patient can be provided with adequate medical supervision during the period of preparation for employment.
4. The patient can meet the other factors of feasibility described heretofore.

HEARING DISABILITIES

Persons having hearing disabilities offer no special problem as to the determination of their eligibility and feasibility. They are subject only to the general policies set forth heretofore. However, as a guide for selecting feasible employments for such cases, hearing disabilities are classified as to type and according to ability to use spoken language as a means of communication in employment. In every case of hearing disability, it should be clearly stated whether the person is able or unable to use spoken language in employment. In general, those having less than 25 per cent hearing loss will not be considered eligible for service. If, however, the prognosis of the examining physician indicates the disability to be of a progressive nature, the case may be accepted and the necessary steps taken to prepare the applicant for suitable employment before the disability becomes a definite vocational handicap.

VISION DISABILITIES

These persons are eligible for rehabilitation service when they come within the general policies governing eligibility, and in addition thereto, conditions may be considered in special cases:

1. When the physician certifies that the occupation at which the applicant is engaged is of such a nature as to aggravate an incipient eye disease and thus cause the disability to rapidly become worse; or
2. When the eye disease is of a progressive nature and visual acuity may reasonably be expected to deteriorate to a rating of less than 20/70 on the Snellen Chart.

In determining feasibility of vision cases, the factor of "ability to profit from rehabilitation service" must be given especial consideration, particularly for the blind and

blinded. The classification of the blind and blinded are based on the client's knowledge of his surroundings and his ability to substitute the senses of hearing and touch for vision in "finding his way about." For the partially sighted, the classifications are based upon the serviceability of residual vision in employment.

OTHER SPECIAL GROUPS

Arthritics—Cases of active arthritis will not be considered eligible or feasible. Cases of arthritic deformity may be accepted when the disease ceases to be active and the individual comes within the general policies of eligibility and feasibility.

Defective Speech—This is subject only to the general policies of eligibility and feasibility.

Occupational Diseases—Cases disabled from occupational diseases will be accepted only upon recommendation of competent medical authority. It would be impracticable to enumerate all the special groups from which eligible and feasible cases might be accepted. We, therefore, must consider the individual case on its own merits, when specific instructions are not available.

TYPES OF CASES NOT ACCEPTED FOR SERVICE

Persons having the following types and degrees of handicaps will not be considered feasible of rehabilitation:

1. Persons requiring permanent custodial care.
2. Epileptics.
3. Persons who are feeble minded or have mental disorders.
4. Homebound and bedridden persons, unless they show unusual ability which may enable them to become self-supporting.
5. Persons affected with advanced form of heart disease, diabetes, tuberculosis, rheumatism, and other progressive disabling diseases.

The key to the successful rehabilitation of any individual is a carefully planned program of service based on his capacities and abilities. A client's potentialities for success

are dependent upon his education, experience, aptitudes, temperament, and interests. Consequently, these factors should be carefully studied, analyzed, and measured as far as possible. Such analysis or diagnosis requires a careful study of the individual and investigation of his school and employment records and his social conduct.

We urge that a careful case diagnosis be made of each client who presents himself for service and that his needs and capacities be determined through interview, investigation, and such scientific procedures as have been demonstrated to be reliable and effective. Any feasible program of rehabilitation must be based upon the results of such careful analysis of the needs and capacities of the individual, and the employment opportunities in his community.

In this connection, we rule that case records shall contain essential data secured through case diagnosis and that they show the formal plans for rehabilitation based in each instance upon the findings of the case study.

One of the first things to be determined in rendering service to an applicant for rehabilitation is whether the extent of his disability can be decreased through physical restoration. If an examination by a competent physician indicates a possibility of improvement in the individual's physical fitness through surgical or other service, such service should constitute the first step in the program of rehabilitation.

Two steps should be followed in providing service for a disabled person in need of vocational training: (1) Select a suitable employment objective, based on the case diagnosis; and (2) Determine the most suitable type of training. It is important in arranging training for a disabled person to provide (1) competent experienced instruction; (2) modern, adequate equipment; and (3) an organized program of instruction based upon the requirements of the occupational objective. Such training is available in public and private institutions of learning, public and private trade and technical schools, commercial or business colleges and schools, and commercial and industrial establishments. In some cases, training can be given effectively

through tutors or correspondence or extension courses, but the latter should be used only when other forms of training are not available, or as supplementary to other forms of training. A thorough investigation should be made of the institution or facility it is proposed to use in providing vocational training for a disabled person, to make sure he will be able to secure, through this institution, practical training for a specific occupation.

In conclusion, it should be emphasized that Vocational Rehabilitation, as defined in the Act is construed to mean the preparation of a disabled person for suitable employment through vocational training rather than through training of a general educational nature. Such interpretation of the meaning of Vocational Rehabilitation, however, does not exclude instruction for the disabled person in subjects related to vocational courses and given in conjunction with them.

Delaware Trust Building.

"PAY YOUR DOCTOR WEEK"

"Pay-Your-Doctor Week" inaugurated last year by California Bank in Los Angeles on a purely local basis, struck a responsive chord in other sections of the country, with the result that the week of November 26 to December 2 of this year has been designated as national "Pay-Your-Doctor Week," with banks in all sections of the country sponsoring the movement.

The November issue of *Banking*, official journal of the American Bankers' Association, carries an article outlining the idea and suggesting that one bank in each city in the country sponsor and publicize "Pay-Your-Doctor Week."

The article, written by Rod Maclean, manager of the advertising and publicity department of California Bank, suggests newspaper advertisements, radio, outdoor advertising, street-car cards and bank statement stuffers as means of publicizing the occasion. In addition, Mr. Maclean suggests that every one engaged in the profession of healing be notified in advance of the date and that a supply of reprints of the newspaper ads be made available for statement enclosures.

A year ago, California Bank recognized the fairly widespread tendency on the part of the public to regard doctor bills as obligations that can wait indefinitely or at least until after all other bills have been paid, and inaugurated "Pay-Your-Doctor Week" in Los Angeles. Because the movement originated entirely outside of the profession the question of ethics was not involved and the idea found instant favor with the Los Angeles medical fraternity.

The success of the movement was thereafter publicized in several national banking and medical periodicals, and California Bank became the recipient of a stream of inquiries from interested banks in all sections of the country. When it became apparent that 1939 "Pay-Your-Doctor Week" would be observed in a number of cities scattered throughout the country, the machinery for making it a national movement was set up by California Bank.

While the movement is not entirely altruistic on the part of sponsoring banks, in that they offer to lend funds for the excellent purpose of paying bills, it does call attention in a striking manner to the plight of many a doctor who is on call twenty-four hours a day but who is generally paid at the patient's convenience.

On January 21, 1939, Olaf M. Bornstad of Minneapolis was called on by the Post Office Department to show cause why the mails should not be closed to the "Bornocks Company," a trade style used by Bornstad in advertising and selling through the mails "Bornock's Tablet Treatment" as a means of producing abortion. Bornstad solicited business "by the use of newspaper advertisements" and letters. Mr. Bornstad waived a hearing and indicated a willingness to have all mail addressed to his company returned to senders. On February 15, 1939, the mails were closed to the Bornock's Company, and its officers and agents as such, because the business was a violation of statutes prohibiting the advertising and sale through the mails of any matter to be used for the purpose of producing abortion. (*J. A. M. A.*, Oct. 21, 1939, p. 1583).

EDITORIAL

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MEDICINE AND POSTAGE STAMPS

Recent advices from Washington convey the information that Postmaster General James A. Farley has abandoned the time-honored policy of honoring only great political and military figures on stamps and through his deputy third assistant postmaster general, Mr. Roy M. North, has prepared a list of 35 eminent Americans whose visages have been chosen for the signal honor of being the first to appear on our stamps now that the traditional rule has been abrogated. Very properly, we think, the list is composed of those who have achieved distinction in the domain of arts and sciences and little exception can be taken to the inclusion of most of them. In the case of medicine, however, we

cannot but wonder a little, from a relative standpoint, at the mental processes which led to the selection of Crawford W. Long and Walter Reed as the foremost representatives of our profession. Without in any way seeking to belittle their accomplishments, let us see exactly what they did. Long was definitely the first to use ether, but he kept all knowledge of it to himself and to those in his own immediate circle. Garrison states that Welch has admirably said "we cannot assign to him any influence upon the historical development of our knowledge of surgical anesthesia or any share in its introduction to the world at large."

The case of Walter Reed, the other representative of medicine in the list, is somewhat different. Reed was chairman of the army board of four which disproved the old theory of the transmission of yellow fever by fomites and accurately fastened the blame on a particular species of mosquito. It was an epochal piece of work, with the most far-reaching consequences but the important point is that it was a joint effort, for which no one man alone should receive distinction. As matters stand, only Reed is recognized, while Carroll, who was the first to submit voluntarily to being bitten by an infected mosquito, developed the disease and recovered; Lazear, who was accidentally bitten and died, and Agramonte, the fourth member of the Commission, are all but forgotten, as also are Nott and Finlay, who first developed the theory of mosquito transmission of yellow fever, long before anyone else had thought of it. Walter Reed has been signally honored by having his name attached to the foremost military hospital in the United States. That, in all the circumstances, should suffice.

Who, then, it may be asked, are those who are more justly entitled to this recognition? There are many; here are a few: John Shaw Billings, who developed the largest medical library in the world and the largest medical museum in this country, initiated the *Index*

Catalogue and the *Index Medicus*, compiled the Medical and Surgical History of the War of the Rebellion, designed the buildings of the Johns Hopkins Hospital and laid down the fundamental principles on which the growth and importance of its medical school have occurred, spending the last seventeen years of his life in the monumental task of reorganizing the New York Public Library System. "Altogether," says Garrison, again, "Billings did a giant's work for the advancement of American medicine." Then, there is William Beaumont who, single-handed and in the crudest surroundings, conducted a series of experiments and made basic findings in the physiology of digestion, so thoroughly accurate that today they remain unchallenged. There is Samuel D. Gross, the foremost American surgeon of the first half of the nineteenth century, who, just 100 years ago this year, wrote the first exhaustive treatise on pathological anatomy in the English language and made many notable contributions to the development of American surgery.

Perhaps we should be thankful that American medicine received any recognition at all in Washington at this time. But as long as those people there were at it at all, it seems as though they might have done a better job. —Editorial, *Minn. Med.*, October, 1939.

MISCELLANEOUS

Malpractice

What Is the Liability of a Physician? How May He Insure It?

Suits for malpractice, which Webster defines as "wrongful or negligent practice, especially in professional conduct," should be and very generally are discouraged by all right-minded people. A majority of the better class of attorneys hesitate or refuse to accept service therein, realizing the fact that the few just claims can usually be adjusted outside of court, and that the other sort have little or no foundation in fact or justice. Making due allowance for human limitations, the cases are rare in which a respectable physician should be haled into court and made the victim of public criticism, censure and pecuniary forfeit, and by the same token, the instances are still more rare in which he is

justified in appearing in court as an expert against a reputable practitioner who is defending himself in a suit for alleged malpractice. Reasonably faithful, skilful and conscientious service should receive the approbation and support of the members of the medical profession rather than their active or passive condemnation—in brief, the honorable physician should be safe with his fellows and associates.

No physician is legally obliged to respond to any call for his professional services. However, having accepted service in any case, the law requires three things of him: first, a reasonable degree of the learning and experience ordinarily possessed by the medical men of the time and neighborhood; second, reasonable and ordinary care of the case committed to him; and third, exercise of his best judgment in cases of doubt. These legal requirements he takes with him into every sick room. Having so acquitted himself, he is not legally responsible for the results in the case, whatever they may be. The law does not call for extraordinary care and skill, in fact even the exhibition of extraordinary care and skill does not shield the physician from malicious attacks of adventurers and blackmailers. The most accomplished physician is as liable to an action for alleged malpractice as is the most disreputable pretender in the community. No qualifications suffice to protect the physician from these assaults, regardless of how skillfully or circumspectly he conducts his practice.

Figures indicate that six times as many patients made allegations of malpractice against their doctors in 1937 as in 1921. For in that year some 36,000 suits were brought, ninety per cent of which were devoid of merit, probably fraudulent, and never got beyond the mere entering. Of the remaining ten per cent, seven per cent were won by the profession, and approximately three per cent were lost. These figures would tend to forecast that one doctor in twenty will be a defendant in a malpractice suit this year. The question, naturally, arises as to the explanation for this increase in medical litigation. Are doctors becoming less competent? Is the public demanding more proficiency in re-

sults? Or is the patient more claim-minded today? The facts would seem to indicate that the answer is to be found in the ever increasing claim consciousness of the public at large, for the majority of malpractice suits are of the nuisance variety, brought in an effort to prevent the doctor from collecting legitimate bills or to provide the improvident with some easy money.

Another factor tending to influence the increase in malpractice claims is the tendency of many doctors, who are without malpractice insurance, to handle these claims alone, even to the point of making voluntary settlements out of court, with the idea of escaping notoriety, trouble and expense. Those advocating this procedure not only injure themselves by such action, but also unwittingly injure every other physician and surgeon in the community, for experience has clearly shown that this sows the seed of the damage suit evil in the minds of others who may then attempt to further their own interest by following a similar course.

To meet this situation and in order to obtain cooperation among the members of the profession, the Aetna Casualty and Surety Company Physicians' and Surgeons' Group Malpractice Policy was designed, it being the aim of the Company to conserve the interests of not only the individual physician involved but the medical fraternity as a whole, through efforts to successfully defend its assured from being mulcted in unjust and illegitimate claims for damages brought against him by unscrupulous attorneys and many times unscrupulous claim makers.

It affords the subscriber protection against any claim of malpractice, error or mistake, whether the suit be fraudulent or otherwise, and no claim may be settled by the Company adjuster without the full consent and approval of the assured. In that respect it differs from all other insurance. It may be purchased in any limits desired, the basic limits of \$5,000/\$15,000 now being available at the reduced rate of \$20 per annum. In addition to the limits of indemnity, the contract also provides for the payment of all expense incurred in the handling of claims or defense of litigation.

The Company has a master contract with the Medical Society, and every physician in good standing in his county society is eligible to subscribe to this contract, receiving a personal oath contract. Members may subscribe at any time, for one year, and the contract is self-renewing.

In Delaware, suits for malpractice must be brought within one year of the date of alleged injury. However, in the case of an infant or minor whose parents or guardians failed to file suit within the statutory limit, said minor may, upon attaining the age of 21, bring suit in his own behalf in certain conditions, and the physician's exposure lasts till the patient reaches age 22. Thus, a physician *may* face a suit 18-20 years after the service was rendered. This emphasizes, first, the importance of being insured throughout one's professional career; second, the importance of preserving each and every policy throughout the years; and third, the supreme importance of being insured in a large and reliable company that will be doing business 20 years from now.

Red Cross Aids Armed Forces

The Congressional Charter of the Red Cross imposes the obligation to act "as a medium of communication between the people of the United States of America and their Army and Navy." In fulfillment of this, the Red Cross is active in many ways.

Perhaps a service man has written home that he expects to go to the hospital in a few days. Then he fails to write for a number of weeks. It is natural that anxiety at home, fostered by a total absence of news, soon turns to fear. Soon a letter, written by a frantic parent is received, demanding to know what is wrong and how serious it may be.

Letters of that kind are turned over to the Red Cross. The medical social workers of that organization who is stationed at the hospital immediately gets in touch with the doctor in charge of the case, visits and talks with the patient, and then writes a letter to the boy's home, giving whatever information may be necessary or suitable.

If it is found advisable that parents come



to visit a patient who is in serious condition, the Red Cross, through its local chapter helps to arrange and finance the trip, if necessary. Sometimes a Red Cross representative meets these people at the train on arrival, finds a place near the hospital for them to stay, and smooths out many another rough spot for them.

The medical social worker in the past two decades has become a recognized necessity. And in virtually all Army and Navy hospitals the Red Cross has taken over these functions. If a man is slow to respond to treatment, the doctor in charge may call upon the Red Cross for background information concerning the individual under his care. Quite frequently this information is sufficient to provide the mental stimulus needed for complete recovery.

Work of the Red Cross is made possible by its millions of members. Their low annual dues provide for all activities, and only in time of great emergency does the organization appeal for special contributions and gifts.

To enable it to keep pace with all demands, and at the same time prepare for any possible emergency, the Red Cross is planning to enroll 1,000,000 new members this year. The High Seas Roll Call of naval personnel takes place during the annual joint appeal of the Navy Relief Society and the Red Cross, which is being held during the month of Sep-

tember. The Roll Call on land begins November 11th and ends November 30th.

Sulphanilimide in Tuberculosis

Recent reports that sulfanilimide has proved beneficial in the treatment of tuberculosis drew a warning today from the National Tuberculosis Association. The Association called attention to a report in the current issue of *The American Review of Tuberculosis* on sulfanilimide and tuberculosis.

Here the serious consequences which might ensue should tuberculosis sufferers take sulfanilimide compounds for the treatment of this disease are emphasized by Dr. H. J. Corper, research director of the National Jewish Hospital of Denver, Col. Dr. Corper and two associates prepared the report on the basis of findings at the Denver Hospital.

Results of their tests do not mean that a tuberculosis patient who has developed pneumonia or streptococcus infection cannot use the drugs as prescribed for those conditions, but that the use of the drug should be confined to the treatment of pneumonia and streptococcus infections.

"The tests have demonstrated," said Dr. Corper in summarizing the survey, "that the utmost caution is required in evaluating the action of the drugs in tuberculosis.

"When given for a short time to man and animals, sulfanilimide and similar drugs are not evidently poisonous, but, if given over an extended period, become profound blood and cell poisons.

"It is these efforts which have led to the erroneous deductions. The animal that is poisoned from the prolonged use of large amounts of sulfanilimide and allied drugs, such as sulfapyridine, cannot produce tubercle cells in certain organs as readily as ordinary tuberculous animals do, and so two things happen.

"In the first place, a deception occurs in that these organs only appear to have less tuberculosis; secondly, but even more important, since the tubercle cells are the ones that actively fight tuberculosis and help maintain health of the individual not treated with sulfanilimide, the injury of these organ cells as

well as the blood cells actually is harmful to the patient, rather than an aid in fighting his tuberculosis.

"This should serve as a timely caution to save the tuberculous from unnecessary injury from the use of drugs until they are exactly tried out in the research laboratory on test animals and by competent analysts. This is especially urgent in an involved and intricate diseases problem such as tuberculosis presents and in which all the phases must be thoroughly understood before conclusions as to the value of the drug for man can be drawn.

"These compounds (sulfanilimide and sulfapyridine) do not affect tuberculosis but injure body cells, the reacting cells."

Maurice L. Cohn, Ph. D., and Clarence Bower, Ph. D., collaborated with Dr. Corper in his research findings.

American Board of Ophthalmology

Written examination, March 2nd, 1940, in various cities throughout the country. This will be the only written examination in 1940.

All applications for this examination must be received before January 1st, 1940. All applicants must pass satisfactory written examination before being admitted to oral examination.

Oral examination: New York City, June 8th and 10th. Fall examination to be announced later.

Case reports: Candidates planning to take June examination must file case reports before March 1st.

For application blanks write at once to Dr. John Green, 6830 Waterman Ave., St. Louis, Mo.

Solution Quinine and Urea Hydrochloride, 5%, with Procaine Hydrochloride, 2%, 30 cc. Vials (Upjohn) Not Acceptable for N. N. R.—This product was submitted to the Council on Pharmacy and Chemistry for consideration. Since the Council had not accepted any sclerosing or obliterative agents for the treatment of hemorrhoids, the firm was asked to supply any evidence it might have to warrant the acceptance of a 5 per cent solution of quinine and urea hydrochloride with procaine hydrochloride for such use.

In reply the firm submitted excerpts from current literature and textbooks on this subject. While the Council has consistently refused to accept any drug for use in the injection treatment of hemorrhoids, it believes that in the hands of some men this method can be used successfully in selected cases. It is known, however, that the injection method of treating hemorrhoids is subject to accidents—infection, embolism, and so on. By accepting the recommendations for the use of injection treatment of hemorrhoids, the Council would add the weight of its influence in favor of routine or general use of this method in unselected cases, which will include those in which the outcome will not be favorable. By refusing recognition to such claims, the Council denies no one the right to use sclerosing agents for hemorrhoids if he wishes to do so. The Council voted that for the present it continue its policy that no preparation for the injection treatment of hemorrhoids be accepted for New and Nonofficial Remedies and declared Solution Quinine and Urea Hydrochloride 5% with Procaine Hydrochloride 2%, 30 cc. vials—Upjohn unacceptable for inclusion in New and Nonofficial Remedies, since it is recommended for this purpose. (*J. A. M. A.*, Oct. 7, 1939, p. 1415).

Magnesium in Nutrition.—The human requirement for magnesium has been studied by a number of investigators. On the basis of balance experiments, the daily magnesium requirement of children from 4 to 7 years of age has been estimated to be not less than 13 mg. per kilogram of body weight. The meager information that is available regarding the magnesium requirement of pregnant women indicates that from 350 to 450 mg. daily is necessary during pregnancy. The daily magnesium requirement for the maintenance of adults has been reported to be as low as 0.2 Gm. and as high as 0.6 Gm. Judging from data available on the magnesium content of freely chosen American diets, the requirement will be met provided the daily energy intake is in the vicinity of 2,500 calories. The possibility of adult human deficiency cannot be ruled out, however, until further information is available concerning

the magnesium requirement. So little is known of the function of magnesium in the organism that clinically observable abnormalities in man cannot at present be said with certainty to be due to magnesium deficiency or to a disorder of magnesium metabolism. The systematic study of magnesium metabolism by accurate analytic and experimental methods is little more than begun. (*J. A. M. A.*, Oct. 7, 1939, p. 1418).

Whilst meager Phthisis gives a silent blow
Her Stroaks are sure; but her Advances slow
No loud alarms nor fierce assaults are shown;
She starves the Fortress first, then takes the Town.

From "The Dispensary: A Poem" in Six Cantos, by Samuel Garth, London, 1699

All behavior is related and it is difficult to distinguish between the behavior which concerns the individual alone and that which concerns others. What a man does about his health, for instance, may concern his family, his business associates, the community and even the entire world. The Purposes of Education in American Democracy, National Education Policies Comm., 1938.

The deficiency of Vitamin C present in tuberculosis may be compensated by administration of a large amount of ascorbic acid. It must, however, be emphasized that among the injurious factors to which tuberculosis gives rise in the system, Vitamin C deficiency is only one and it is a fatal error to suppose that administration of Vitamin C can have a decided influence on the tuberculous process or makes general treatment unnecessary. On the other hand, Vitamin C is a useful adjuvant to hygienic and dietetic therapy and artificial pneumothorax. It is best given intravenously. Melzer, E., *Deut. Tuber. Blatt*, 1938.

Tuberculosis—Early discovery means early recovery.

Patch Test for Children—One hundred and sixty-nine children at Sea View Hospital, Staten Island, New York, were given the Mantoux intracutaneous tuberculin test together with the tuberculin patch test and it was found that only one failed to react to the patch test who reacted positively to the Mantoux test. One hundred and eighteen additional children were tested in the pediatrics service at Mount Sinai Hospital in New York and the Mantoux test revealed no case which had not been discovered by the patch test. The value of the patch test for young children appears to be firmly established and it has the additional advantages that it never provokes a general reaction and never frightens either the children or the parents. Vollmer, H. and Goldberger, E. W., *Amer. Jour. Diseases of Children*, Sept., 1938.

Trends in Mortality—A study of the trends in the mortality from tuberculosis for the last sixty years fails to show any reason for the fact that the rate for women over 30 has declined more rapidly than for men in the same age group. The explanation may be that the home furnishes a more favorable environment than industry or business, or could it be that women have adapted more readily to civilization, with respect to tuberculosis? Dauer, C. C., *Amer. Jour. of Hygiene*, May, 1938.

Tuberculosis in Massachusetts remains the most serious of the communicable diseases. The toll of tuberculosis is between four and five times as great as the sum of the recorded deaths from all other communicable diseases excepting influenza and the pneumonias, despite the reduction of 75% in the death rate since 1900. The average duration of a case is between three and four years with an approximate cost of a thousand dollars for hospitalization. Since the peak of incidence comes between the ages of 20 and 40, the wage earner is frequently involved so the remainder of the family in many cases becomes
(Concluded on xvi)



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(Concluded from 246)

the burden of the community thus adding to the financial and social costs of the disease. Pope, A. C., *Commonwealth*, Jan., 1939.

"Tuberculosis is the captain of the men of death."—John Bunyan.

BOOK REVIEW

Synopsis of Pediatrics. By John Zahorsky, Professor of Pediatrics, St. Louis University, M. D., Professor of Pediatrics, St. Louis University, assisted by T. S. Zahorsky, M. D., Instructor in Pediatrics, St. Louis University. Third edition. Pp. 430, with 144 illustrations and 9 color plates. Cloth. Price, \$4.00. St. Louis: C. V. Mosby Company, 1939.

The third edition of this comprehensive work contains the essential information found in pediatric literature. It is very practical and can easily be read. The illustrations are well selected and the plates are excellent.

Special attention has been given to the paragraphs on treatment. Stress is laid upon the clinical features of disease. Practically

every phase of pediatrics has received more or less discussion in this small volume. No references are given, the authors assuming, of course, that one will consult texts or original articles for more detailed information.

It is interesting to note that in the chapter on diseases of the genito-urinary organs the authors have this comment to make in discussing phimosis: "The common practice of circumcising all boys a week after birth has very little to commend it. The prepuce is needed during the diaper age to protect the glands and the meatus from irritating urine. We recommend little or no attention be paid to the prepuce until the infant is seven or eight months old, when retraction of the prepuce usually is easy. If the prepuce is very narrow at one year of age and retraction is impossible, then circumcision is indicated."

This Synopsis of Pediatrics should be on the desk of everyone who treats diseases of children, for it contains concise information on all except the most rare conditions of infancy and childhood.

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

